



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/820,117	04/07/2004	Wenjie Li	FIS920030394US1	8647
30449	7590	06/01/2005	EXAMINER	
SCHMEISER, OLSEN + WATTS			LEE, SIN J	
3 LEAR JET LANE			ART UNIT	
SUITE 201			PAPER NUMBER	
LATHAM, NY 12110			1752	

DATE MAILED: 06/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/820,117

Applicant(s)

LI ET AL.

Examiner

Sin J. Lee

Art Unit

1752

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5,7-10 and 13-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 21 is/are allowed.
- 6) ☒ Claim(s) 1-5,7-10,13-20,22 and 23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. Applicants canceled claims 6, 11, and 12.
2. Previous obviousness-type double patenting rejection on claims 1-5, 7-10, and 13-20 over copending App.'157 in view of Koibuchi et al'883 is hereby withdrawn. The Examiner agrees with applicants' argument that one skilled in the art would not be motivated to combine those claims of App.'157 with Koibuchi's teaching of polyhydroxystyrene resin due to different chemistry of those compositions taught in those two references.
3. Due to newly cited prior arts, the following rejection is made non-final.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-5, 8-10, 13-20, 22, and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Iwanaga et al (JP 9-325492 and its machine-assisted English translation provided by Japan Patent Office).

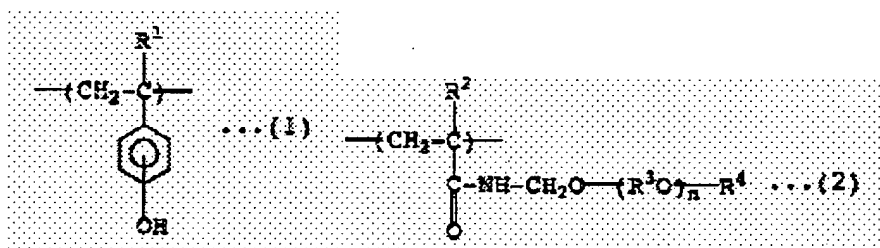
Full, formal English translation of the Japanese document has been submitted.

Only the machine-assisted English translation is available at this time.

Iwanaga teaches (see abstract and claim 1 of the machine-translation) a negative photosensitive composition, which contains (i) an alkali-soluble copolymer

Art Unit: 1752

comprising a repeat unit of the following formula (1) and a repeat unit of the following formula (2) and (ii) a photoacid generator:



In the formula (2), n is 0-5, and R^4 can be H atom or an alkyl group of 1-4 carbon atoms. Specifically, in one of his working examples (see [0055] of the machine-translation), Iwanaga synthesizes a copolymer of p-vinylphenol and N-methacrylamide (which meets the formula (2) shown above in which $n = 0$, and R^4 is H). Therefore, the prior art teaches present components (a) and (b). Iwanaga also teaches (see [0035]-[0038] of the translation) that another alkali soluble resin (other than his copolymer shown above) can be added in his photosensitive composition, and after listing examples for such other alkali soluble resin, Iwanaga teaches (see [0038]) that a polyvinyl phenol, a copolymer of vinyl phenol and styrene, a copolymer of isopropenyl phenol are “*especially desirable*” from a viewpoint of excelling in dry etching resistance. Since polyvinyl phenol is listed as one of only three *especially preferred* examples for the other alkali soluble resin, one skilled in the art would immediately envisage using polyvinyl phenol as the another alkali soluble resin in Iwanaga’s photosensitive composition. Since polyvinyl phenol teaches present second polymer of the formula (2), Iwanaga teaches present inventions of claims 1, 2, and 5 (the polyvinyl phenol resin contains phenolic hydroxyl group which is an aqueous base soluble group).

With respect to present claims 3 and 4, Iwanaga teaches ([0013]) that his copolymer (which is shown above) can contain third repeat unit, and as one of four kinds of compounds that form the third repeat unit, Iwanaga discloses an ethylenically unsaturated *carboxylic acid* compound. Therefore, one of ordinary skill in the art would immediately envisage Iwanaga's copolymer shown above to further include the third repeat unit formed from the ethylenically unsaturated *carboxylic acid* compound. Therefore, the prior art teaches present inventions of claims 3 and 4.

With respect to present claims 8-10, Iwanaga teaches ([0029]) the use of an acid-diffusion control agent of the formula $R^5R^6R^7N$ (in which R^5 - R^7 can be H atom, an alkyl group or an aryl group) in his photosensitive composition and also teaches ([0062]) the use of a solvent such as heptanone. Therefore, the prior art teaches the present inventions of claims 8-10.

Iwanaga (see [0059]) applies his photosensitive composition onto a silicon wafer to form a resist coating, and the resist coating is irradiated with KrF excimer laser thorough a mask. The exposed resist coating is then developed to form a negative pattern. Also, since Iwanaga mentions the dry etching resistance of his resist coating (see [0038]), it is the Examiner's position that the etching step is impliedly taught by Iwanaga. Therefore, Iwanaga teaches present inventions of claims 13, 14, and 16-20.

With respect to present claim 15, Iwanaga also teaches ([0046]) that ArF excimer laser (193nm) can be used as a light source. Therefore, the prior art teaches present invention of claim 15.

In Example 7 (see [0060] and [0062]), Iwanaga uses his copolymer shown above in the amount of 12 wt.%, his other alkali-soluble resin in the amount of 8 wt.%, his solvent in the amount of 80 wt.%, and his photoacid generator in the amount of 2.5 wt.% based on the first and the second polymer. Therefore, the prior art teaches present inventions of claims 22 and 23.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Iwanaga et al (JP 9-325492 and its machine-assisted English translation provided by Japan Patent Office) in view of Yoon et al (US 6,537,727 B2).

Iwanaga uses a triphenylsulfonium triflate as his photoacid generator (see [0062]). The triphenylsulfonium triflate and triphenylsulfonium perfluorooctanesulfonate are known in the art to be interchangeable as photoacid generating compounds as evidenced by Yoon, col.10, lines 40-56. Since those two compounds were art-recognized equivalents at the time the present invention was made, it would have been obvious to one of ordinary skill in the art to use triphenylsulfonium perfluorooctanesulfonate in Iwanaga with a reasonable expectation of obtaining a photosensitive resin composition that gives a rectangular pattern with high resolution. Therefore, Iwanaga in view of Yoon would render obvious present invention of claim 7.

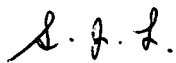
Allowable Subject Matter

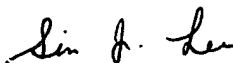
8. Claim 21 is allowed. Iwanaga (JP'492) does not teach or suggest present second polymer of claim 21, which includes an aqueous base soluble moiety of a fluorosulfonamide, a carboxylic acid, or a fluoroalcohol.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sin J. Lee whose telephone number is 571-272-1333. The examiner can normally be reached on Monday-Friday from 9:00 am EST to 5:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly, can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


S. Lee
May 26, 2005


SIN LEE
PRIMARY EXAMINER